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November 20, 2002

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Subject: Submittal of Final Draft Fugitive Dust Work Plan and Response to Comments on the Draft Fugitive Dust Work Plan dated July 11, 2002

Please find enclosed the Final Draft Fugitive Dust Work Plan and Response to Comments on the Draft Fugitive Dust Work Plan, dated July 11, 2002. The Final Draft Fugitive Dust Work Plan has been prepared on the basis of the comments received on October 9, 2002 from the Nevada Division of Environmental Protection and from the U.S. Environmental Protection Agency. Atlantic Richfield Company appreciates this opportunity to respond to the comments provided by the regulatory agencies for the subject document.

<u>General Comment</u>
While this document has provided an outline for an approach to studying the airborne dust and particulate problem in Yerington, it has severe limitations in both its Data Quality Objectives (DQOs) and its ability to provide the necessary data to determine if airborne surface materials from the Site have an adverse effect on the health and environment of its off-site receptors.

Response to General Comment: Atlantic Richfield believes that the DQOs are consistent with the first phase of a phased approach to collecting air quality data related to potential fugitive dust emissions from the mine site. The air quality and meteorological data to be collected for the period of one year will provide the basis to identify data gaps and conduct additional investigations, as necessary. In YTWG discussions prior to submittal of the Draft Work Plan, Atlantic Richfield believed that a consensus was reached regarding a phased approach, starting with the installation of a meteorological station and a single air-quality monitoring station down-wind of the most likely emission source of fugitive dust at the mine site (i.e., the fine-grained materials within the Sulfide Tailings Area).

Atlantic Richfield strongly believes this approach, based upon the collection of real data, to be the most efficient and technically sound approach, given that there are no site-specific data to evaluate the off-site fate and transport of potential fugitive dust emissions. Based on one year of air quality monitoring and the collection of wind speed and direction data to establish baseline conditions for the site, additional air pathway investigations would be implemented if the data indicates the necessity of additional investigations. This approach was anticipated in the agency-approved Closure Scope of Work for the Yerington Mine Site:

"Fugitive dust from existing surface facilities at the Yerington Mine site has been observed at certain times. An evaluation of existing meteorological data in the vicinity of the site will be performed and, on the basis of the data review and empirical observations of fugitive dust sources, Atlantic Richfield will install one or more air monitoring stations. A Work Plan for fugitive dust air monitoring will be prepared and submitted for approval".

By conducting the air pathway evaluation in this manner, Atlantic Richfield would be able to identify and quantify any fugitive dust emissions from the site that may pose a threat to human health and the environment. These data can then be used to support the evaluation of closure alternatives and, if necessary, to evaluate the off-site fate and transport of original or re-suspended.

Specific Comments

Page 3, Section 1.3; The data presented from the earlier PM10 data collection should be presented along with a description of the methodology and/or meteorology data.

There was no description of methodology associated with the data presented. Atlantic Richfield has been unable to locate any supporting information and would like to receive this information for use in the revised Work Plan.

The ambient air quality monitoring data for the Fort Churchill power plant was submitted to NDEP by Sierra Pacific Power Company's ambient monitoring contractor, ENSR. The wording may not be clear that the data were not generated by NDEP monitoring. This also applies to Table 2.1, titled "Air Quality Monitoring results (ug/m3) from NDEP 1996-1998" in Appendix A.

The revised Work Plan will reflect this comment.

Page 4, Section 1.3; Previous Monitoring and Assessments; A few corrections are necessary regarding the April 2001 visit by Mike Abbott of the Idaho National Environmental Laboratory (INEL). Mike Abbott is with INEL and not ETSC. INEL is a contractor for the EPA Technical Support Center (TSC) in Las Vegas and assisted EPA on this Site visit. Mike's observations should be attached to the report as an Appendix, rather than cutting sentences from his report. The visit was short and no in-depth scientific measurements were taken. For example, while it was stated that there was a crusted surface, it was also noted that trespassers and other traffic had broken through in certain areas, and thus destroyed this cover.

The appropriate corrections to references will be made in the revised Work Plan. This comment suggests that the information presented in the referenced document is anecdotal rather than scientific. Atlantic Richfield could not find the description " that trespassers and other traffic had broken through in certain areas, and thus 'destroyed' this cover". What is presented in the report is the description that "although some unauthorized off-road vehicle (dirt bike) use has been observed in the past, there was no evidence of any *significant activity or tracks during the tour". If these descriptions are confusing, Atlantic Richfield suggests that EPA provide the technical information to suggest the contrary. If a more complete report is available or other pertinent information that EPA believes should be included in the Work Plan that was omitted, Atlantic Richfield would like to receive it for inclusion in the Final Work Plan*

Page 5, Section 1.3; We cannot confirm that all of the iron bleed tailings (red dust material) have been capped. For example, part of the side of a roadway with red dust was not capped during this process.

The revised Work Plan will reflect that it is possible that not all "iron bleed tailings" may have been capped.

Page 5, Section 1.4; Data Quality Objectives; The Yerington Technical Workgroup should define and agree on investigation elements and endpoints. We recommend that the investigation of fugitive dust be completed in phases; a trigger at each phase should determine the next phase given the large area of the Site and the adjacent communities. The work plan should examine the potential off-site impact, by investigating what is leaving the mine Site and is in the air off-site. Part of the investigation needs to establish if the dust blown from the Site contains or has significant metal concentrations adsorbed to the particulates, or the particles themselves are high in metals and metalloids.

Also, the investigation design may be different depending upon whether one is looking at particulate issues, or acute or chronic health effects (i.e., one may want to see if there is a potential health effect issue or just a nuisance dust issue), one could design a potential investigation to see if households adjacent to the Site have any high amounts of contaminated dust. One way to do this is to gather vacuum bags from the households over a period of several months and have the contents analyzed for metals of concern to see if there is any adverse health effects level (the DQOs set in advance would have to look at health effects or PRGs, etc.). This would give us an idea of acute exposures. With chronic exposures, we would probably have to rely on soil surface concentrations, since it is possible that attic samples would not be useful (unless there are homes where no insulation was installed in the past 10-15 years).

Atlantic Richfield appreciates the conclusion that the air pathway evaluation should be conducted in phases. In keeping with the phased approach for this investigation, the Data Quality Objectives for the Draft Work Plan were focused on evaluating the possible occurrence and characteristics of fugitive dust emissions from the mine site (by definition, fugitive dust is dust that leaves the mine site). Secondary depositional sources and re-suspended dust that may contribute to fugitive dust leaving the site cannot be adequately addressed until the first phase of data is collected and analyzed. For example, the speed and direction of winds measured at the meteorological station that correspond to the collection of fugitive dust at the air quality monitoring station(s) will provide guidance in what to look for off-site in the down-wind direction for deposited dust with the geochemical signature identified as being sourced from the mine site. Atlantic Richfield agrees that the collection of ambient air quality data with a proper methodology will help document the characteristics of fugitive dust and particulate matter, and believe the Draft Work Plan provides for a proper methodology.

Until the proposed meteorological and air quality data are collected and evaluated for the nominal one-year monitoring period, it is premature to define DQOs related to acute and chronic health issues. Atlantic Richfield agrees that an additional air pathway investigation may be conducted, but its scope and associated DQOs cannot be defined at the present time without the data proposed to be collected in the Draft Work Plan.

Atlantic Richfield understands that a more extensive and in-depth evaluation than previous studies may possibly be needed beyond the proposed first phase of investigations. However, an evaluation of potential off-site impacts must be predicated on what is leaving the mine, which the Draft Work Plan addresses. Given all the other fugitive dust emission sources in the area around the mine site (agricultural areas, native alluvium, dust from vehicular traffic on dirt roads, abandoned mine sites on public lands), it is premature and beyond the scope of Atlantic Richfield's site closure responsibilities to address what "is in the air off-site" and what might be collected in vacuum bags from households in the area.

Atlantic Richfield agrees with the comment that "the investigation needs to establish if the dust blown from the Site contains or has significant metal concentrations adsorbed to the particulates, or the particles themselves are high in metals and metalloids".

As an example, limited lead sampling was conducted as part of the recent red dust interim remedial action at the mine. While most sample results were well below the EPA Region IX Preliminary Remediation Goal (PRG) residential standard for lead, and no samples exceeded the industrial standard, one sample of the red dust material did exceed the residential standard for lead of 400 mg/kg in soil. If further sampling indicates that lead may be present in concentrations that may be hazardous to human health or the environment, further investigation may be required. If this further investigation indicates that there is potential for this material to be transported off-site at levels that warrant further evaluation, the DQO should reflect the possible need for blood sampling and the incorporation of the use of the lead biokinetic model for the risk assessment.

Atlantic Richfield suggests that although one sample of the red dust material did exceed the EPA Region IX PRG residential for lead of 400 mg/kg in soil, this occurrence does not constitute the need for site investigations beyond the phased approach presented in the Draft Work Plan. However, the mine site is not a residential site but an industrial site. Also, given the temporary capping of most or all of the red dust material with oxide tailings, this potential source of metal-bearing fugitive dust has been mitigated. The suggestion that the DQO for the Fugitive Dust Work Plan should anticipate the possible need for blood sampling and the use of a biokinetic model for a risk assessment is premature at this time.

The objectives should also include secondary depositional sources. Re-suspended dust could add to the overall particulate matter both on- and off-site. Collection of ambient air with a proper methodology will help document dust and particulate matter that is respirable, both on-site and off-site. Some of the NDEP guidance in Appendix B is out-of-date. The Nevada Bureau of Air Quality's Ambient Air Quality Monitoring Guidelines will be revised to change the recommended meteorological sampling frequency from two seconds to at least once per second to accommodate the EPA-recommended Mitsuta method for averaging horizontal wind directions (Meteorological Monitoring Guidance for Regulatory Modeling

Applications, February 2000). This method utilizes single-pass processing and requires that consecutive wind direction samples not differ by more than 180 degrees.

The concepts of re-suspended fugitive dust and secondary depositional sources are presented in the Conceptual Site Model with regard to the air pathway. However, as stated in the previous response, these concepts cannot be adequately addressed until the first phase of data is collected. Please see the last Response to Comment for a response to the meteorological monitoring method issue.

Include a discussion regarding the use of modeling. Development of closure alternatives should also include reclamation.

Again, any discussion regarding modeling is premature until the first phase of data is collected. Reclamation, as a closure alternative, will be evaluated as part of the Final Permanent Closure Plan.

Page 6, Data Quality Objectives; Other exposure pathways should be included in the paragraph starting, the problem statement (Step 1) is as follows. Please see comments for Figure 5.

Atlantic Richfield suggests that this statement adequately covers the exposure pathways discussed by the YTWG. However, other exposure pathways related to the air pathway identified in the Site Conceptual Model will be presented in Figure 5 of the Final Draft Work Plan.

Page 7, Data Quality Objectives; It is possible that one year of air quality monitoring would not be sufficient.

Any further monitoring would be based upon an evaluation of the data collected for the proposed one-year period.

Page 11, Section 2.2, Potential Pathways and Transport Mechanisms; Please see comments on the Conceptual Site Model under Figure 5. For example, dusts have many indirect pathways (see U.S. EPA, Multiple Pathway Exposure documents; available on the EPA web site). For example, domestic animals can carry large amounts of metal-laden dusts into the closed house, which is then inhaled. It has been shown that in dry, arid areas, this load (human exposure pathway) from indirect and secondary exposures can be substantial.

The Conceptual Site Model has been, and the Fugitive Dust Work Plan will be revised to reflect this possible exposure pathway.

Page 12, Section 3.0, Workplan; Please correct or delete the conclusion attributed to ETSC. If the site has 2-and 4-wheel drives cris-crossing it, these tailing areas will have a significant potential for fugitive dust emissions. Erosion, heavy rains and other factors can play a role in destroying this very limited cap.

We believe the conclusions attributed to EPA's contractor in the Draft Work Plan to be appropriately derived and referenced from the ETSC report (see Appendix B of the Final Draft Work Plan). In addition, the following observations made by Mr. Benjamin Castellana (Ecology and Environment Inc. Superfund Technical Assessment and Response Team) are relevant: "On October 22, 2000, a cold front blew through the Yerington area, causing winds up to 20 miles per hour and gusts up to 40 miles per hour. The START drove around the site several times and to an overlook on the northwest of the site to see if there were any evidence of tailings materials blowing off the site. While the START observed significant dust clouds emanating from the nearby agricultural fields, there was no such activity emanating from the site" (Expanded Site Inspection; December 14, 2000, Environmental Protection Agency). Atlantic Richfield is unclear why EPA is requesting to remove site-specific information from its own contractors that provides relevant input to the Fugitive Dust Work Plan.

Atlantic Richfield also recognizes that off-road vehicles can stir up tailings materials that have the potential to become fugitive dust emissions, and supports all YTWG initiatives that eliminate this activity.

Page 12, Section 3.0; The last sentence of this section states that Atlantic Richfield proposes to synthesize the meteorological and air quality data collected over a 12-month period to evaluate the effects of PM10 emissions and possible COCs on human health and the environment in a Data Summary Report. It may be appropriate to evaluate the data in a screening assessment as part of a data summary report to determine if there is a complete air pathway for any COCs. If there is a complete pathway for any COC it will be necessary for Atlantic Richfield to complete a risk assessment evaluating multiple exposure pathways, including the air pathway. Please provide details on how Atlantic Richfield will address any human and ecological health effects.

Based on the results of the nominal one-year monitoring period, Atlantic Richfield proposes to discuss the integrated meteorological and air quality data with the YTWG to determine the potential for fugitive dust to pose a risk to human health and the environment. The SOW states that risks to human health and the environment will be evaluated in the FPCP. It would be presumptuous to provide the details on how any human health and ecological risks will be addressed prior to collecting and evaluating the data to determine whether such risks actually exist.

Page 12 and 13, Section 3.1, Proposed Monitoring; EPA assisted in selecting suitable locations for air monitors on August 29, 2002. Overall, the fugitive dust work plan should propose a minimum of 5 samplers to get a thorough understanding on dust being blown from the Site toward the city of Yerington and toward populations living north and northeast of the Site. However, for the current baseline project, we would suggest that, at a minimum, 3 stations be established. These stations would not be duplicated as is done in the guidance for a facility, but rather single stations of the same genera as that in the Nevada guidance (as well as the EPA guidance) with some exceptions. The first station would be located near the meteorological station. The second station would be at an approximate angle of 5 o'clock down to the middle of the sulfide tailings pond (UNUM 328000 x 1550000) see the fudicial point on Brown and Caldwell's Figure 3 from May, 2002). The third point would be in the center of these points, approximately at the corner of the unlined and evaporation ponds below the service road. According to the early wind rose diagrams, this would be the direction that a majority of dust particles would follow leaving the Site.

The discussion between EPA's representative (Dave Reisman) and Atlantic Richfield's technical consultant, Brown and Caldwell, held on August 29, 2002 resulted in the recommendations described in this comment. The band of possible locations across the northern margin of the Sulfide Tailings Area for the single air quality monitoring station presented in the Draft Work Plan was based on available meteorological data for the site (e.g., the rose diagram presented as Figure 3 of the Draft Work Plan) relative to the area believed to be the most likely to emit fugitive dust, based on grain size (i.e., the Sulfide Tailings Area). Based on the diagram, higher speed winds, presumably of sufficient force to suspend dust particles, blow to the northeast.

As requested, Atlantic Richfield will install three air quality monitors, without co-located quality assurance samplers as suggested in this comment. However, if this approach is taken, Atlantic Richfield does not anticipate receiving comments from EPA or other members of the YTWG during the air pathway investigation that may be targeted to invalidate or otherwise undermine the quality of the data collected during the proposed monitoring. Two of the three air quality samplers will correspond to the locations suggested by EPA's representative, Mr. Reisman. With regard to the third sampler, Atlantic Richfield believes that locating an air quality monitoring station upwind of the site will prove more valuable than adding a third location at the downwind portion of the site. By placing the third station upwind of the site, the YTWG will be able to evaluate the quantity and quality of potential incoming dust and fugitive dust. The difference between the samplers in the two areas may provide for a better understanding of potential fugitive dust emissions from the mine site.

Storm events should be monitored, and several events charted and sampled. We suggest that additional samplers be located at these points or the same samplers could be used when not running total samples. The samplers could operate on a switch tied to the met station and when the wind speed exceeds a given number then the samplers turn on for a timed interval (possibly an hour or two). Regional met data could be consulted to develop an idea of storm length, and local residents could be queried. A background comparison is recommended on several low wind or no wind days for the same period of time.

The current monitoring proposal is based upon state and federal agency approved methods to collect data over a wide range of conditions. Focusing data collection on non-representative transient conditions, such as during storm events, could skew the data set so that it is not representative and not usable for the evaluation of human health or ecological risk.

Samplers used for comparison to the PM10 standards must be designated by the US EPA as a Federal Reference Method or Equivalent Method. These samplers should be sited as closely as possible to the guidance in 40 CFR 58, Appendix E, Probe Siting Criteria for Ambient Air Quality Monitoring. The most difficult guidance to meet in the desert west is often that "Stations should not be located in an unpaved area unless there is vegetative ground cover year round, so that the impact of wind blown dusts will be kept to a minimum."

To the extent practicable, Atlantic Richfield will attempt to conform with EPA guidance. However, none of the three locations proposed by EPA in the comment above (Page 12 and 13, Section 3.1, Proposed Monitoring) meet the quoted guidance.

Page 14, Quality Assurance and Quality Control; The Quality Assurance and Quality Control section is unacceptable and should be prepared according to EPA's guidance documents. EPA will provide these on request or they can be obtained from EPA's website. Atlantic Richfield stated in the January 30, 2002 response to comments that a QA/QC Plan could be developed one time prior to the various site investigations, with specific addendums developed for each mine unit or as part of specific Work Plans as necessary. Please provide a date for submittal of the QA/QC Plan as this must be reviewed and approved prior to initiation of fieldwork. The QA/QC issues listed should also include calibrations and audits.

Pursuant to discussions held at a previous YTWG meeting (held on August 22, 2002), Atlantic Richfield will prepare an "over-arching" Quality Assurance Project Plan (QAPP) for all field investigation activities at the Yerington Mine Site, including air quality monitoring and sampling. The revised Fugitive Dust Work Plan will include the appropriate QA/QC protocols. A draft version of the QAPP is proposed to be submitted to the YTWG by December 23, 2002.

In addition, we would like to formally request a copy of the EPA's QA/QC Plan, and Sampling and Analysis Plan and subsequent results for sampling conducted by EPA in June 2001. These reports and data have been requested verbally numerous times, and would be helpful in our Work Plan and QAPP preparation.

Figures 3, 4; Data sets should be included with the wind rose patterns. For example, it is difficult to determine if the center point is where the met station is located or at the office at the mine site.

Updated data sets and wind rose diagram will be included in the revised Work Plan. The center point of the wind rose diagram is located at the meteorological station.

Figure 5; a) Ecological receptors should be added for fugitive dust. Some of the specific ecological receptors include livestock (horses) and crops. The exposure route should include incidental ingestion, b) the dermal exposure route should be added for sediment for human and ecological receptors, c) for groundwater, potential receptors include livestock and crops. The exposure route should include dermal contact, and d) Food chain pathways should be listed on the figure. For example, fish or hunting of game (deer/rabbit).

The Conceptual Site Model has been, and the Fugitive Dust Work Plan will be revised to reflect these possible exposure pathways.

Figure 5; Add a box in the Potential Sources column for secondary sources to account for a) dust re-suspended and b) sediments to the Wabuska Drain (contaminants to surface or groundwater).

As discussed in Response to Comments for the Draft Final Conceptual Site Model (dated October 9, 2002) and presented in the final version of the Conceptual Site Model (dated October 10, 2002) as approved by the regulatory agencies, these sources and pathways are adequately presented in the flow diagram without the addition of a box in the potential sources column.

Appendix B: The Nevada Bureau of Air Quality's Ambient Air Quality Monitoring Guidelines will be revised to change the recommended meteorological sampling frequency from two seconds to at least once per second to accommodate the EPA-recommended Mutsuta method for averaging horizontal wind directions (Meteorological Monitoring Guidance for Regulatory Modeling Applications, February 2000). This method utilizes single-pass processing and requires that consecutive wind direction samples not differ by more than 180 degrees.

Atlantic Richfield will ensure its monitoring procedures conform with the revised guidelines. Please provide a copy of the revised guidelines as soon as they are available, and the meteorological monitoring procedures will then be modified.

If you have any questions regarding the responses to comments, please contact me at 1-406-563-5211 ext. 430.

Sincerely,

Dave McCarthy
Project Manager

Atlantic Richfield Company

FINAL DRAFT

FUGITIVE DUST WORK PLAN
YERINGTON MINE SITE

November 20, 2002

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Prepared By:

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SECTION 1.0
INTRODUCTION

Atlantic Richfield Company (Atlantic Richfield) has prepared this Draft Fugitive Dust Work Plan (Work Plan) to conduct phased investigations that will support an evaluation of the potential risk to human health and the environment that may result from fugitive dust generated by mine surface units and process areas at the Yerington Mine Site. Fugitive dust emissions from the mine will be evaluated using one or more strategically-placed air quality monitoring stations at the site. Monitoring results will be evaluated in the context of Nevada Division of Environmental Protection (NDEP) regulations for air quality. This Work Plan is being conducted pursuant to the closure investigations described in the Closure Scope of Work (SOW).

The remainder of Section 1.0 of this Work Plan describes the location and topographic setting of the Yerington Mine site and how this setting may influence fugitive dust. Section 1.0 also presents previous monitoring and analytical results from NDEP (1994) and related information. In addition, this section, describes Work Plan data quality objectives. Section 2.0 presents information about potential sources, pathways, and receptors of fugitive dust (i.e., Site Conceptual Model for fugitive dust). Section 3.0 presents the proposed initial sampling location, how measurements of fugitive dust will be taken, and sampling and analytical protocols for fugitive dust analyses. In addition, Section 3.0 of this Work Plan presents a task-specific Job Safety Analysis in the context of a more comprehensive Health and Safety Plan. Section 4.0 lists references cited in this Work Plan.

1.1 Location

The inactive Yerington Mine Site is located approximately one mile west of the town of Yerington in Lyon County, Nevada (Figure 1). The site includes an open-pit mine (partially filled with a pit lake), areas of waste rock, tailings, process ponds and leach pads. Various buildings, structures, and miscellaneous disturbances associated with mining operations also occur at the site. The area of the mine units and related disturbances shown in Figure 2 total approximately 2,892 acres.

The Yerington Mine Site is located in Mason Valley and the Mason Valley hydrographic basin (no. 108) within the Walker River watershed. Agriculture has been the principal economic activity in Mason Valley (principally hay and grain farming, with some beef and dairy cattle ranching). In addition to agriculture, historic and recent mining activities have added to the area's economic base.

1.2 Topography and Climate

Topography and climate in the area of the Yerington Mine site are important factors in the amount, location and timing of fugitive dust generation, dispersion and deposition. Huxel (1969) summarized the geology and hydrology of the Mason Valley, which includes the mine site and the surrounding area. Mason Valley covers about 510 square miles and is bounded on the east by the Wassuk Range, on the north by the Desert Mountains, on the west by the Singatse Range, and on the south by the Pine Grove Hills.

The Yerington Mine Site is located on the west side of Mason Valley, a structural basin surrounded by the mountain ranges described above. The area is typical of basin-and-range topography. The mountain blocks are primarily composed of granitic, metamorphic and volcanic rocks with minor amounts of semi-consolidated to unconsolidated alluvial fan deposits. The Singatse Range contains mineralized bedrock, as evidenced by the large copper porphyry ore deposit at the Yerington Mine. Other previously mined and disturbed areas occur in the Singatse Range, including the Bluestone mine, which may also contribute to fugitive dust in the area. Copper ore production from the Bluestone mine principally occurred from 1917 through 1920 (Moore, 1969).

Unconsolidated alluvial deposits derived by erosion of the uplifted mountain block of the Singatse Range and alluvial materials deposited by the Walker River fill the structural basin occupied by Mason Valley in the vicinity of the mine site. These unconsolidated deposits, collectively called the valley-fill deposits by Huxel (1969), comprise four geologic units: younger alluvium (including the lacustrine deposits of Lake Lahontan), younger fan deposits, older alluvium and older fan deposits. Lake Lahontan lacustrine deposits appear to have been removed and reworked by the Walker River as it meandered back and forth across the valley Huxel (1969). Huxel estimated that Pleistocene Lake Lahontan in Mason Valley persisted for a relatively short time and was less than 60 feet deep.

Huxel (1969) summarized the climate of the Mason Valley area as arid to semi-arid. Precipitation generally occurs as winter snows in the mountain ranges, and summer thundershowers occur both on the mountains and valley floor. Precipitation averages 20 inches in the mountains and 5 inches on the valley floor. Huxel (1969) cited an evaporation rate of approximately 4 feet, and described prevailing winds and storm trajectories that cross the valley as being generally from the west. The estimated pan evaporation rate for the site is about 37 inches per year based on data from Fallon, which has a similar climate (Piedmont Engineering, 2001). The precipitation and evaporation data indicate a strongly net evaporative water balance for the valley floor and lower alluvial fan areas where the Yerington Mine site is located.

1.3 Previous Monitoring and Assessments

NDEP performed PM_{10} monitoring in June, July and August of 1994 at two locations: 1) on top of the sales-office building at Weed Heights; and 2) on top of a garage on the frontage road east of the sulfide tailings pile (exact address unknown). PM_{10} monitoring showed values below the U.S. Environmental Protection Agency's (EPA) national ambient air quality standards (NAAQS) for a 24-hour period (150 ?g/ m^3). Samples were also collected for sulfate and copper extractions with results of 0.4669 ?g/m^3 and 0.0496 ?g/m^3 respectively. Data from NDEP's 1994 monitoring activities are provided in Appendix A.

Air quality monitoring data collected from 1996 to 1998 from a location near Fort Churchill Power Plant (approximately eight miles to the northeast of the Yerington Mine Site) are also provided in Appendix A. These data indicate that all PM_{10} measurements are well below the EPA 24-hour standard of 150 ?g/m^3.

McGinnis and Associates (McGinnis) conducted air quality investigations for the Yerington Paiute Tribe Reservation and Colony in 2001. They noted the lack of local meteorological data for the Yerington area, and primarily used meteorological data collected at the Fort Churchill power plant from 1996 to 1998 to describe the atmospheric conditions in the Mason Valley. The Fort Churchill data was compared with a number of National Weather Service (NWS) stations such as Reno, Winnemucca, Tonopah, Dead Camel and Como.

Based on this comparison, McGinnis (2001) concluded that the Dead Camel data could be used to represent long-term climatic conditions in the northwestern part of Mason Valley. Wind speed and direction data compiled in this report varied greatly between stations, making it difficult to determine a predominant wind direction. Mcginnis used a "Superfund Procedure" to estimate the amount of PM_{10} emissions from the mine site. Due to the lack of local meteorological data and varied regional data, it was noted that only a rough estimate could be made of the potential emissions. McGinnis also listed the following emissions sources in the Yerington area:

- Fugitive dust emissions from mobile sources on unpaved roads;
- Emissions from industrial processes: mining and quarrying;
- Fugitive dust emissions from mobile sources on paved roads
- Emissions from miscellaneous area sources: agricultural production – livestock, beef cattle feedlots;
- Emissions from waste disposal, treatment, and recovery (open burning, residential); and
- Emissions from other industrial processes (construction, wind erosion).

During EPA's expanded site inspection of the mine site in 2000, the Ecology and Environment Inc. Superfund Technical Assessment and Response Team (START, contractor to EPA) made the following observations: "On October 22, 2000, a cold front blew through the Yerington area, causing winds up to 20 miles per hour and gusts up to 40 miles per hour. The START drove around the site several times and to an overlook on the northwest of the site to see if there were any evidence of tailings materials blowing off the site. While the START observed significant dust clouds emanating from the nearby agricultural fields, there was no such activity emanating from the site" (START, 2000).

In April 2001, a representative (Mike Abbott) of the Applied Geosciences Group, part of the Idaho National Engineering Laboratory (INEL) and a subcontractor to the EPA's Engineering Technical Support Center, conducted a site visit to the Yerington Mine in the company of EPA and NDEP staff and individuals representing the Paiute Indian Tribe (ETSC, 2001). ETSC produced a report entitled: *Air Pathway Contaminant Transport Potential from Mine Tailings/Waste at the Yerington Mine, Nevada – Initial Observations from the April 25, 2001 Site Visit*, reproduced in Appendix B of this Work Plan. A limited reconnaissance survey was conducted to assess the potential for wind suspension and downwind transport of contaminated dust. Based on the observations in this report, the ETSC subcontractor concluded: "the potential for significant airborne transport of contaminated tailings areas appears to be relatively low at the present time".

The INEL subcontractor also noted that relatively high wind speeds would be required for dust suspension due to a high coverage of non-erodible elements (0.5-1cm) on the surface of this pond. A red dusty area, known as the "iron bleed tailings" and located in the Oxide Tailings area, may have been a source for airborne contamination in the past, but have recently been capped by NDEP with a well-compacted and cemented material (oxide or "vat leach" tailings). At present, it is uncertain whether or not all of the "iron bleed tailings" have been capped.

Atlantic Richfield recently installed a meteorological station at the northeast corner of the evaporation pond area (Figure 2) in the second quarter of 2002 to support the air quality monitoring proposed in this Work Plan. Wind speed and direction data collected from this station between May 6 and June 12, 2002 and between July 29 and November 6, 2002 indicate a predominant wind direction with relatively low wind speeds to the south and southwest with less frequent but stronger winds blowing to the northeast (Figure 3). Raw data downloaded from the meteorological station is provided as Appendix C.

Moderate wind speeds, usually below 5.4 m/sec (12 mi/hr), are associated with winds blowing to the south and southwest. In contrast, much stronger winds with speeds greater than 11 m/sec (24 mi/hr) are associated with winds blowing to the east and northeast. These data are similar to those summarized by McGinnis and Associates (2001) using regional weather data. Periods of high wind speeds are most likely to create potential fugitive dust emissions from the site.

1.4 Data Quality Objectives

The Data Quality Objectives (DQOs) for phased field sampling and analytical activities described in this Work Plan include the collection of appropriate data to support the:

- Assessment of ecological and human health risk resulting from potential transport of fugitive dust being to possible downwind receptors, and identification of such receptors;
- Development of closure alternatives for surface mine units at the Yerington Mine site that may source fugitive dust.

Data collection proposed in this Work Plan will be consistent with the NDEP – Bureau of Air Quality Monitoring Guidelines provided as Appendix B. In order to ensure that data of sufficient quality and quantity are collected to meet the project objectives, a four-step DQO process was used to develop this Work Plan:

- Step 1. State the Problem;
- Step 2. Identify the Decision;
- Step 3. Identify the Inputs to the Decision; and
- Step 4. Define the Boundaries of the Study.

The problem statement (Step 1) is as follows: "The inactive Yerington Mine Site, including the various mine units and process areas contained within it, may potentially contribute to fugitive dust emissions in the Mason Valley area given appropriate meteorological conditions. Fugitive dust from the site with elevated constituents of concern (COCs) may pose a risk to human health and the environment through direct inhalation, or by the ingestion of soils where previous deposition of fugitive dust containing COCs have accumulated.

Step 2 of the DQO process (Identify the Decision) asks the key question that this Work Plan is attempting to address: "What monitoring, sampling and analytical activities for locations at the Yerington Mine will serve to evaluate the potential risk to human health and the environment, and support the development and evaluation of closure activities at the Yerington Mine site?" The field monitoring and sample collection and analysis activities proposed in this Work Plan will be compared to previous investigations (NDEP, 1994). The criteria necessary to determine if the proposed Work Plan activities will answer this question include:

- Will the collected data adequately document potential transport of fugitive dust and COCs from the Yerington Mine site, to potential downwind receptors; and
- Will the collected data support the development of site closure activities for the mine site.

Step 3 of the DQO process (Identify the Inputs to the Decision) identifies the kind of information that is needed to address the question posed under Step 2. Relevant information includes local meteorological data, identification of other upwind or downwind emission sources that may contribute to fugitive dust in the area, previous field monitoring and analytical results, proposed field monitoring and analytical results (described below), and the identification of potential downwind receptors and areas where fugitive dust may accumulate.

The information to be obtained from the proposed field monitoring and sample collection and analytical activities will provide an adequate basis to satisfy these criteria. A phased air quality monitoring approach will establish the potential need for additional air quality monitoring locations. Integration of approximately one year of air quality monitoring with a similar period of meteorological data collection at the Yerington Mine Site will provide important information that is necessary to meet the DQOs listed above .

The proposed field monitoring, sample collection and analytical activities, described in detail in Section 3.4, consist of the following:

- Collection of PM_{10} (particulate matter of 10 microns or less in size) monitoring samples at 6-day intervals from an appropriate (downwind) air quality monitoring location at the Yerington Mine;

- Analysis of collected samples on a quarterly basis for potential COCs using X-ray fluorescence (XRF) or other appropriate analytical techniques; and
- Continued collection of climate data from the recently installed meteorological station on the Yerington Mine site.

As part of other site investigation activities described in the SOW, Atlantic Richfield will be collecting grain size data of surface materials to assist in the evaluation of closure alternatives for surface mine units, and to identify appropriate cover materials. These grain size data will be integrated with the meteorological and air quality data to evaluate the potential for fugitive dust generation from the mine site in the Final Permanent Closure Plan.

Step 4 of the DQO process (Define the Boundaries of the Study) defines the spatial and temporal aspects of the field monitoring, sampling and analytical activities proposed in this Work Plan. Location of two proposed air quality monitoring stations along the downwind margin of the site and one air quality monitoring station upwind of the site (Figure 4) will provide data sufficient to evaluate the amount and character of fugitive dust emissions from the site. The precise monitoring locations will be determined based on a more detailed site inspection and logistical considerations such as vehicular access and power availability. PM_{10} data and metals analyses, in combination with meteorological data collected at the mine site, will establish the information necessary to meet the DQOs, and provide the basis for additional data collection and investigations of the potential for fugitive dust to pose a human health or ecological risk.

The field and analytical activities described in this Work Plan are anticipated to begin in 2002 immediately after approvals have been granted by regulatory agencies. It is anticipated that air quality monitoring (sampling and analysis) and meteorological data collection will be conducted for approximately one year prior to the creation of a Data Summary Report

SECTION 2.0

POTENTIAL SOURCES, PATHWAYS AND RECEPTORS

2.1 Potential Sources

The Yerington Mine Site has a history that dates back to the early 1950s. The Anaconda Mining Company produced copper from the Yerington Mine from 1953 to 1978. Sulfide copper ores were milled and copper was recovered as concentrate from a flotation circuit. Sulfide tails were placed in a large raised tailings impoundment. Spent solutions and brines from the oxide ore precipitation process were placed in large lined and unlined evaporation ponds located in the northwest part of the property. Oxide ores were processed with sulfuric acid in a vat leaching process. The spent ore was removed from the vats and placed in a large dump known as the oxide vat-leached tailings (VLT) dump. This material is granular and appears to be generally smaller than 0.375 inches in particle size. From 1978 to 1988, Mr. Don Tibbals conducted miscellaneous mining, milling, and heap leach recovery operations on the property. In 1989, Arimetco International took over operations at the mine and constructed four lined leach pads at various locations.

The result of mining and ore processing activities at the Yerington Mine led to the creation of a number of mine units and process areas (Figure 2). These mine units and related surface disturbances can be considered as potential sources of fugitive dust emissions. A list of the various mine units and process areas are as follows:

<u>Tailings Impoundments:</u>

- Sulfide Tails
- Sulfide Dump Tails
- Oxide Tails

Waste Rock Areas:

- Waste Rock Area (North)
- Waste Rock Area (South)

Evaporation Ponds:

- North, Middle and South Lined Evaporation Ponds (dry)
- Unlined Finger Evaporation Ponds A-E (dry)
- Unlined Evaporation Pond (dry)
- Pumpback Evaporation Pond (wet, currently used for water management)

Leach Pads:

- Phase I Heap Leach Pad
- Phase II Heap Leach Pad
- VLT Heap Leach Pad
- Slot Heap Leach Pad

Figure 4 combines the surface mine units shown in Figure 2 with the wind rose diagram presented in Figure 3, and facilitates an understanding of predominant wind directions relative to the existing site features. Some mine units may have a greater potential to contribute to fugitive dust emissions than others due to location, local topography and/or grain size of surface materials. As noted previously in Section 1.3, the ETSC report concluded that the majority of tailings areas do not have the potential to contribute to fugitive dust emissions due to the presence of cement-like and crust-like surfaces found on the majority of the mine units. The one exception noted by ETSC was an area formerly used for evaporation purposes in the Sulfide Tailings area. Additionally, an area that may have contributed to past fugitive dust emissions was the “red dust area” that, for the most part, has recently been covered by NDEP with a non-erodible cap to prevent fugitive dust emissions.

The inactive Blue Stone Mine, located approximately four miles southwest of Yerington (Figure 2) and generally upwind from the Yerington Mine site, may contribute fugitive dust to downwind areas. Other possible sources of fugitive dust in the area of the mine site include agricultural activities, residential emissions from wood/coal burning, and the local roadway system. Areas outside of Mason Valley that are upwind of the mine site may also contribute to fugitive dust emissions in the Yerington area.

2.2 Potential Pathways and Transport Mechanisms

The relationship between the potential mine site sources, potential pathways and potential receptors is schematically presented in Figure 5. This flow diagram is part of the Conceptual Site Model currently under development for the Yerington Mine Site. Media pathways shown in Figure 5 include fugitive dust and soil. COCs in surface mine units and exposed soils at the mine site could potentially be released to the environment through wind erosion and atmospheric dispersion as fugitive dust. Fugitive dust has the potential to come into direct contact with downwind receptors or be deposited at downwind locations. Accumulated COCs have the potential to be re-suspended by wind and transported further downwind, be leached into the surrounding soil during periods of heavy precipitation, or be eroded into surface water. COCs leached into soils may have the potential to migrate into shallow groundwater.

2.3 Potential Receptors and Exposure Routes

Potential receptors of fugitive dust and COCs include humans (e.g., workers, visitors and residents) and ecological (terrestrial biota). Routes of exposure to ecological receptors include dermal contact or ingestion of soils and surface water where fugitive dust and COCs have accumulated. Potential exposure routes to human receptors include:

- Inhalation of, or dermal contact with, primary or re-suspended fugitive dust;
- Ingestion of COCs from soils with fugitive dust deposits; and
- Ingestion of COCs in ground and surface water where COCs deposited by fugitive dust erosion have accumulated.

SECTION 3.0
WORK PLAN

Atlantic Richfield proposes to conduct air quality monitoring consistent with the State of Nevada Bureau of Air Quality (Ambient Air Quality Monitoring Guidelines, 2000 http://ndep.state.nv.us/baqp/monguide.html) that will focus on PM_{10} emissions, and metals concentrations in the fugitive dust, that may be transported by wind off-site. Due to the inactive status of the mine site, and based on the ETSC observations described above, it is anticipated that only "relatively coarse" particles derived from geologic materials will have the potential to erode and contribute to fugitive dust. The EPA considers such particles to be from 2.5 to 10 microns in diameter. These particles usually come from sources of windblown dust from unpaved roads agricultural fields, and desert. "Relatively fine" particles, those less than 2.5 microns in diameter, are primarily the result of industrial and residential vehicle exhaust and combustion (EPA, 1997). Atlantic Richfield proposes to integrate the meteorological and air quality data collected over a 12-month period to evaluate the effects of PM_{10} emissions and possible COCs on human health and the environment in a Data Summary Report.

3.1 Proposed Monitoring

As part of the phased approach to air quality monitoring at the site, Atlantic Richfield proposes to install PM_{10} sampling equipment at the three locations shown in Figure 4. The two locations at the northern margin of the site are downwind of the sulfide tailings and evaporation pond areas. These proposed locations are based upon regional and local prevailing wind direction data and their position relative to fine-grained materials present in these mine units. The third location is proposed along the southwest (generally upwind) margin of the site, to monitor ambient fugitive dust blowing towards the site from an upwind direction.

The previously installed meteorological station is also shown in Figure 4. The data from this station will be used in conjunction with air quality sampling in order to assess the impact to air quality downwind of the Yerington Mine Site. With the collection of these and other important data (e.g., seasonal variations in wind direction and wind speed, particle size data from surface mine units, meteorological and air quality data collected at the Paiute Tribe Reservation), the potential for, and character of, fugitive dust emissions at the site will be established.

The proposed air quality monitoring station and sampling program at the Yerington Mine site has been developed according to the NDEP -- Bureau of Air Quality Monitoring Guidelines, which are attached in Appendix D. The air quality samplers will consist of single PM_{10} samplers operated from midnight-to-midnight once every sixth day according to the NDEP-recommended monitoring schedule and consistent with EPA guidelines. Per EPA recommendations in the October 9, 2002 comment letter, Atlantic Richfield will not install co-located samplers as a quality control procedure.

3.2 Data Collection and Analysis Procedures

All samplers will be of the same mid-volume type, and will have the same inlet type and flow control features. Sampler inlets will be between the range of 2 to 15 meters above ground and be at least 2 meters away from all structures that may be possible obstructions to airflow. All calibrations, sampling and analysis will be conducted in identical manners for the three samplers. Mid-volume sampling will be conducted with a flow rate of 113 L/min (4 ft^3/min). Teflon filters (47mm) will be used to facilitate XRF spectroscopy for metals analysis. For specific metals of interest not suitable for XRF analysis (e.g., beryllium), another analytical method will be used (see Appendix E). Metals analyses will be conducted on a quarterly basis.

<u>Calibration and Inspection</u>

Manufacturer-supplied calibration information for each sampler will be used as guidance in field calibration prior to use. A drift check will be performed after sampling is completed using a volumetric rate method and/or gas standard. The purpose of the drift check is to assess the change in flow or the loss of instrument sensitivity that often occurs when measurements are performed at different sample locations under different ambient air conditions and target constituent concentrations. During calibration, a closure plate perforated with a number of circular orifices will be connected to the sampler inlet. The pressure drop across this orifice plate provides a measure of instrument air flow rate at any time. This pressure drop may be indicated by a rotameter, manometer, or other pressure-responsive device traceable to an NIST certified standard (EPA, 1999). Instrument calibration information and instrument accuracy limits will be recorded in the field notebook and presented in the Data Summary Report.

All mid-volume sampler filters will be visually inspected for defects, and defective filters must be rejected if any are found. Batches of filters containing numerous defects should be returned to the supplier. Specific defects to look for are pinholes, loose material, non-uniformity or symmetry, or discoloration.

Sampling and Monitoring

Sampling and monitoring will be conducted according to the Nevada Ambient Air Quality Monitoring Guidelines issued by the NDEP/ Bureau of Air Quality and published EPA guidance. The following information will be obtained:

- Sampler identification
- Run date and time
- Type of sampler and model
- Elapsed run time (minutes)
- Actual flow rate (m^3/min)
- Standard flow rate (m^3/min)
- Calibration methods
- Minimum detection limit
- Maximum detection limit
- Filter serial number
- Gross filter weight (g)
- Tare filter weight (g)
- Net weight (g)
- Particulate concentration (ug/m^3)

Air quality monitoring will be conducted with mid-volume PM_{10} samplers operated for 24 hours once every sixth day according to the NDEP-recommended monitoring schedule, consistent with EPA guidelines. As described above, the YTWG has modified the quality control use of co-located samplers to achieve the site-specific objectives of monitoring potential fugitive dust emissions at the mine site. The reference method for PM_{10} sampling is given in 40 CFR Part 50, Appendix J and implemented in the "Quality Assurance Handbook for Air Pollution Measurement Systems, Volume II," Section 2.11 and in the "Quality Assurance Guidance Document 2.11, Monitoring PM_{10} in Ambient Air Using a High-Volume Sampler Method".

Sampling Procedures

The following procedure is recommended by EPA (1999) for air sampling using a PM_{10} high-volume air sampler, to be modified for the mid volume samplers to be used at the Yerington Mine Site:

1. Perform a laboratory check to determine if the sampler is operational. Turn on the sampler and observe the vacuum motor performance and shift the recorder response (if so equipped).
2. Carefully transport the sampler to the field site. Following manufacturer's instructions, carefully assemble the base and inlet of the sampler. The sampler must be bolted down to a secure mounting surface. Refer to Section 6.3 of this QAPP for specific sampler installation procedures.
3. Check all tubing and power cords for crimps, cracks, or breaks.
4. Plug the power cord into a line voltage outlet. The use of waterproof interlocking electrical connectors is recommended to ensure operator safety and to avoid shorts or power interruptions.
5. Turn on the sampler and make sure that it is still working properly. Investigate and correct any malfunctions before proceeding. Operate the sampler for approximately 30 min to ensure that the motor brushes are properly seated and that the motor is operating at full performance.
6. Perform a multipoint flow-rate calibration, as described in the instrument calibration manual. Do not make any change or adjustment on the sampler flow indicator after calibrating.
7. Remove the calibrating orifice. Mount the filter sheet in the filter holder taking care not to lose any of the fiber. Clamp it in place by means provided. Seal into place easier by facing the smooth side into the housing if there is a difference in texture. If the

filter holder is separate from the sampler, mount the holder on the intake port, making sure that the coupling gasket is in place and that it is tight.

8. Place the sampler in the position and location called for in the test, which is with the filter face up, in a horizontal plane, and inside a housing. The dimensions and clearances specified are intended to provide uniformity in sampling practice.
9. Start the sampler motor and record the time and date. Note the temperature and barometric pressure. Read the flow-rate indicator and record this reading and the corresponding flow rate as read from the calibration curve. An electric clock should be connected to the same line as the motor so as to detect any loss of test time due to power interruption. A continuous record of the sampling flow rate and sampling time can be obtained by the use of a continuous pressure (or flow rate) recorder.
10. Allow the sample to run for the specified length of time, which is commonly 24 h, ±1 h. During this period several readings of flow rate, temperatures, barometric pressure, and time should be taken if this is feasible. A final set of reading is taken at the end of the test period. If only initial and final readings are made, assume that change of readings is linear over the period of test. Intermediate readings will improve the accuracy of volume measurement.
11. At the end of the sampling period, record all final readings. Remove the filter from the mount very carefully so as not to lose any of the fiber material or collected particulate matter. Fold the filter in half upon itself with the collected material enclosed within. Place the folded filter in a clean tight envelope or metal container and mark it for identification.

PM_{10} filters will be weighed prior to, and after sampling, and after they have been allowed to equilibrate to temperature (between 15 and 30 ?C) and humidity (20 to 45 percent) for 24 hours. An EPA-certified laboratory will perform the chemical analyses of the particulate matter collected on the filters on a quarterly basis. Particulate matter will be analyzed for metals using the X-Ray Fluorescence (XRF) Air Filter Analysis with the exception of beryllium, which must be analyzed using atomic absorption analysis. Teflon filters will be used to facilitate XRF spectroscopy for metals analysis.

Sampling will conform with the sixth-day particulate sampling schedule recommended by EPA or as agreed upon by the YTWG (e.g., for specific storm events). Each sampler shall be operated for 24 hours at least every designated sixth day throughout the year. For continuous ambient air quality monitoring data, at least 45 minutes of valid observations are required to represent an hourly average. Running averages of more than one hour shall require valid observations for at least 75 percent of the hours in the averaging period.

Mid-volume PM_{10} sampling calculations will conform to the Quality Assurance Guidance Document 2.11, Monitoring PM_{10} in Ambient Air Using a High-Volume Sampler Method or Section 2.11 of the "Quality Assurance Handbook for Air Pollution Measurement Systems, Volume II, Ambient Air Specific Methods (Interim Edition). The concentration of PM_{10} in the ambient air is computed as the total mass of the collected particles divided by the volume of air sampled. Based on the proposed one-year monitoring period to collect baseline data at the mine site, analytical results will be compared to the one-year average of the 99th percentile of 24-hour PM_{10} concentrations at each sampling location.

Sampling for metals analyses will be conducted on a quarterly basis.

Sample Identification and Preservation

All collected samples will be carefully removed from the air sampler and placed in sealed, non-reactive containers. Filter samples will be placed in a container sealed with tape over the top and bottom to avoid accidental opening of the container. The tape will serve a custody seal, and be labeled with the date, time, and initials of the field personnel. The tape will firmly secure the container to ensure that it cannot be removed without destruction.

Sample labels shall be completed and attached to each laboratory sample container prior to collection of the sample. The labels shall be filled out with a permanent marker and shall include the following information:

- Sample identification
- Sample date
- Sample time
- Analyses to be performed
- Sample type
- Person who collected sample

Each sample will be tracked according to a unique sample field identification number assigned when the sample will be collected. This field identification number consists of three parts:

- Sampling event sequence number
- Sampling location
- Collection sequence number

For example, a hypothetical sample collected along the north edge of the Sulfide Tailings Area during the third sampling event at the fourth location sampled would be labeled: 003STN004. Blanks and duplicate samples shall be labeled in the same fashion, with no indication of their contents.

Sealed containers with air sample filters or bags of air should be placed inside an ice chest, with no ice. The presence of ice would cool the bags, allowing potential condensation, or may allow moisture to enter the filter containers, both undesirable occurrences. Sealed plastic bags of sampled air should be filled to less than full capacity to allow for expansion and contraction of the air and bag in case the samples are transported to a different elevation. This procedure will avoid potential bursting of the bag.

<u>Decontamination Procedures</u>

All air sampling equipment will be cleaned between sampling events. Parts of mid-volume air samplers that have been exposed to sampled air flow shall be cleaned in accordance with the manufacturers' instructions. Tubing on personal air samplers will be replaced with new tubing. Fresh air shall be allowed to run through probes and meters in accordance with the manufacturers' instructions, and for a period of not less than two minutes.

<u>Duplicate Samples</u>

Duplicate samples will be collected at a frequency of one per every 10 samples for each analysis. Duplicate samples will be collected by filling the containers for each analysis at the same time the original sample is collected. In general, duplicate samples will be collected in the same manner as regular samples. For quality assurance purposes, duplicate samples shall be labeled in the same fashion as regular samples, with no indication that they are QC samples. Each sample from a duplicate set will have a unique sample number labeled in accordance with the identification protocol, and the duplicates will be sent "blind" to the lab.

Each sample from a duplicate set will have a unique sample number labeled in accordance with the identification protocol, and the duplicates will be sent "blind" to the lab. For example, a duplicate sample to 003STN004 might be labeled 003STN006, with documentation in the field notebook that 003STN006 is a duplicate of 003STN004.

Quality Assurance and Quality Control

All procedures used for data collection and analysis will follow the specifications and procedures described in Section 3.2. These procedures will ensure that the type, quantity, and quality of data collected are reliable with regard to providing information needed to satisfy the DQO's listed in Section 1.4. The data collection and analysis procedures will adhere to quality assurance/quality control (QA/QC) methods to ensure that the quality and quantity of the analytical data obtained during field activities are sufficient to support the DQO's. QA/QC issues include:

- Detection limit and laboratory analytical requirements;
- Selection of appropriate levels of precision, accuracy and comparability for the data;
- Identification of confidence levels for the collected data;
- Sample handling issues; and
- Routine maintenance schedules for sampling devices.

QA/QC procedures for the NDEP-certified laboratory used for PM_{10} and metals analyses will be documented in the Data Summary Report.

3.3 Site Job Safety Analysis

A site-specific Job Safety Analysis (JSA) is presented in Appendix F for the activities described in this Work Plan, in accordance with the Yerington Mine Site Health and Safety Plan (SHSP). The SHSP identifies, evaluates, and prescribes control measures for safety and health hazards, in addition to providing for emergency response at the Yerington Mine site. SHSP implementation and compliance will be the responsibility of the contractor, with Atlantic Richfield taking an oversight role. Any proposed change to the SHSP by the contractor will be reviewed by Atlantic Richfield Safety Representative Lorri Birkenbuel prior to its acceptance or incorporation into the SHSP. A copy of the SHSP will be maintained at the site, at Atlantic Richfield's Anaconda office, and at the contractor's office. The SHSP includes:

- Overall safety and health risk or hazard analysis;
- Task-specific JSAs;
- Employee training records;
- Personal protective equipment (PPE);
- Medical surveillance and hospital routes;
- Site control measures (including dust control);
- Emergency response; and
- Spill containment program

The SHSP includes a section for site characterization and analysis that will identify specific site hazards and aid in determining appropriate control procedures. Required information for site characterization and analysis includes:

- Personnel involved in each aspect of the work being performed;
- Description of the response activity or job tasks to be performed;
- Duration of the planned employee activity;
- Site topography and accessibility by air and roads;
- Safety and health hazards;
- Hazardous substance dispersion pathways; and
- Emergency response capabilities.

Contractors must provide proof of required training, as outlined in 29CFR 1910.120(e) and as stated in the SHSP. Required training, depending on the particular activity or level or involvement, will include MSHA 40-hour training and annual 8-hour refresher courses. Personnel will initially review the JSA forms prior to commencing tasks associated with the Fugitive Dust Work Plan. Site-specific training will be covered at this briefing, with an initial site tour and review of site conditions and hazards. Elements to be covered in site-specific training include: persons responsible for site-safety, site-specific safety and health hazards, use of PPE, work practices, engineering controls, major tasks, decontamination procedures and emergency response. Records of pre-task briefings will be attached to the SHSP.

The JSA for this Work Plan incorporates individual tasks, the potential hazards or concerns associated with each task, and the proper clothing, equipment, and work approach for each task. The following table outlines the tasks and associated potential hazards included in the JSA:

SEQUENCE OF JOB STEPS	POTENTIAL HAZARDS
1. Prepare and collect filters	?? Dust inhalation
2. Collect meteorological data.	?? Electrocution
3. All Activities	?? Slips, Trips, and Falls
4. All Activities	?? Back, hand, or foot injuries during manual handling of materials.
5. All Activities	?? Heat exhaustion or stroke.
6. All Activities	?? Hypothermia or frostbite.

SECTION 4.0

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